A newsletter of the Local Technical Assistance Program (LTAP)

Issue Number 44, Fall 1994

Bulletin

Think Snow – Now!

Most people think it is a little premature, but public employees responsible for snow removal know that it is never too early to start thinking about next winter's snow removal.

The lack of a good snow plan or proper implementation can bring the wrath of the public down around one's ears, with severe consequences to follow. Certain elements should be addressed in all snow plans, whether for a small city or town, a rural county, or an urban municipality. At a minimum, people who make snow plans should:

- ❒ **Develop a policy statement.** The statement can range from doing nothing regardless of the amount of snow and ice, to a clear pavement policy on major roads or streets.
- ❒ **Develop a separate performance budget.** The budget should be based on need. Use storm log data from past years to determine the number and severity of storms and to project needs and costs for subsequent seasons. A budget separate from other activities for snow and ice control will help eliminate the proverbial approach of robbing Peter to pay Paul.
- ❒ **Utilize resources of local contractors to supplement one's own forces.** It is not feasible or cost effective for a government to provide enough equipment and stockpile enough materials to handle those unusually severe storms. Negotiate contracts with appropriate contractors before winter begins. Be sure that the contracts stipulate timely response by the contractors once they are notified.
- ❒ **Train operators.** New operators should be trained and tested for their manual abilities and understanding of plowing procedures, routes to be plowed, and sequencing of priorities of plowing. The seasoned operators likewise should be periodically trained and annually informed of changes in procedures. The operators need to be trained to be sure they are not hazardous to the traveling public or to themselves.
- ❒ **Schedule purchases of materials.** Adequate quantities of abrasives and chemicals in the right place at the right time is necessary.
- ❒ **Check equipment.** Check equipment well in advance of the first storm. If repairs are needed, do the work expediently. Calibrate sanders in advance of need.
- ❒ **Establish a priority schedule.** Set up a priority plan for sanding and/or plowing. Establish which locations and/or routes are covered first, second, and so on. Also, establish repeat time spans for sanding and/or plowing.
- ❒ **Designate snow routes.** While designating snow routes may be unnecessary in small or rural communities, they are vital in more populated areas where there is considerable traffic. During snow emergencies, enforcement of the snow route criteria (regulations) is vital in order to keep main routes open and traffic moving. This may mean ticketing and/or towing vehicles that violate the rules.
- ❒ **Establish chain stations.** Chains or adequate snow tires are required, depending on traffic conditions.

(Adapted from On the Move, Utah Technology Transfer Center Newsletter, November 1990.)

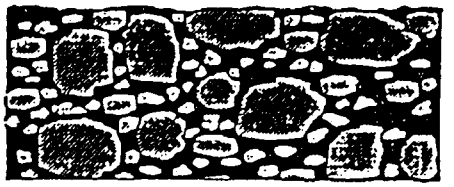
Contents

What's New (in Pavements)? — SMA!

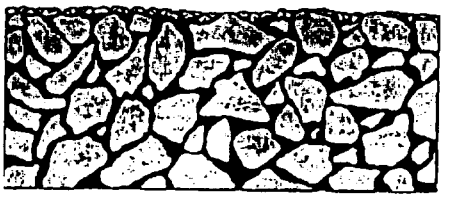
By Ed Stellfox

Several new products are currently being tested for use across the United States by the Strategic Highway Research Program (SHRP). One of these is a product known as stone mastic asphalt (SMA). This product originated in Europe and has been used in Germany quite extensively. European development of the product was for abrasion resistance under the wear of studded tires. Studded tire usage has been eliminated in all but Sweden, but the use of SMA continues. Europeans use SMA for abrasion resistance and noise reduction, but the material may be a solution to our rutting problem.

The theory of SMA optimizes stone on stone contact. Aggregates of tightly controlled size and shape are utilized. As seen from the figure, the material has basically a one size, roughly symmetrical stone which forms a skeleton for the mix. Thus, high internal friction is



Hot-Mix Asphalt



Stone Mastic Asphalt

produced which will hinder deformation or rutting. The mastic material also is high in asphalt content (6 to 7 percent) which provides a more stable pavement. In Europe, the material has proved to be more durable and less susceptible to low temperature cracking. Studies are exploring the use of cellulose or polymer additives which are added to the mix.

Existing plants and equipment are used to produce and lay the material. Higher mixing temperatures are necessary because of the coarser aggregates. Rolling takes place immediately after placement in order to achieve proper density. Compaction is accomplished using 10 to 12 ton steel wheeled rollers. Vibratory rollers can decompact the mix if not used properly.

Twelve SMA research projects were constructed in 1992 with good results. These projects will be monitored to determine where to use this new material, what the limit on thickness will be, the advantages of the modifiers, and the best construction procedures.

(Source: Ed Stellfox, RTAP Engineer for Pennsylvania's T² Program published this in their newsletter "Moving Forward" dated April 6, 1993.)

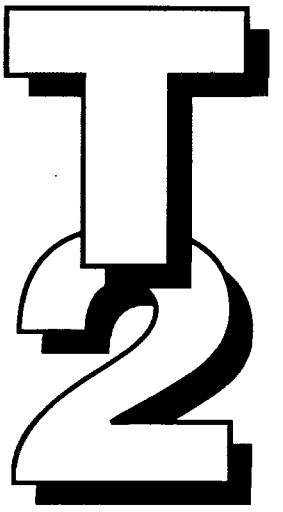
Correction to "Test Your Metric Knowledge" of the Summer 1994 Bulletin

12 Which SI metric unit is always used for dimensioning or engineering drawings?

A. Meter
B. Decimeter
C. Centimeter
D. Millimeter

The answer given was "C." The correct answer is either "A" or "D" depending on the type of drawing.

T^2 Center — Ready to Serve

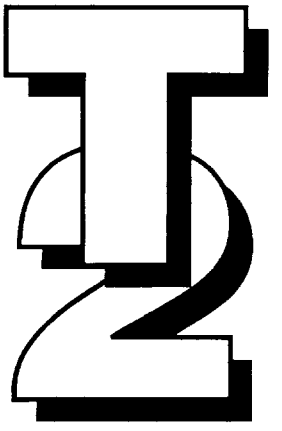


By George Crommes

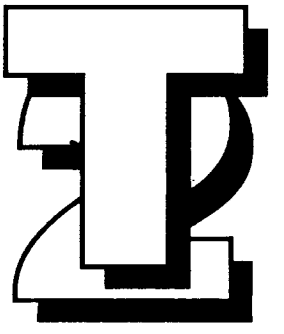
We were surprised to learn recently that some of you and your fellow colleagues were not aware of the technology transfer (T^2) program here in Washington State. A survey for FHWA has shown that 85 percent of the people surveyed knew about the Washington T^2 program. This was quite a bit higher than the 30 to 50 percent shown in other states that were surveyed. It appears that some public works people have not attended any of the numerous workshops or road shows; received technical publications; used WSDOT's library, or visited the T^2 booth at the Road Builder's Clinic, Street and Road Maintenance Supervisor's Schools, the Washington Association of County Road Supervisor's Conference, APWA or other numerous conferences and seminars.

Others may not be aware of the T^2 Centers ability to provide technical advice. Our Advisory Committee members are available to discuss your needs and ideas and are only a phone call away.

If you know of people in your organization or others who you believe could benefit from our T^2 services, please spread the work that the Center is available. If you want, call member of our advisory committee or Center staff with your questions and comments.



- ***Road Shows***
- ***Workshops — Seminars***
- ***Newsletters***
- ***Library Service***
- ***Video Loans***
- ***Technical Materials***
- ***Technical Advice***
- ***Electronic Bulletin Board***
- ***Co-sponsor of Conferences, Road Schools, Clinics***



Ten More Commandments of Political Engineering

by George C. Protopapas

The first "Ten Commandments of Political Engineering," by George Protopapas were reprinted in the Summer 1993 issue of the "Bulletin."

During my 24 years as a county engineer in San Luis Obispo, it became clear to me that civil engineering knowledge is not always enough to succeed in local government. You also need to understand political engineering. "Political engineering" is the "technology" of getting along with an elective body as your boss.

Last year I wrote an article entitled, "The Ten Commandments of Political Engineering." Since publication of that article, I have found that there is a lot of interest in this subject. Many engineers have told me that the political process can be one of the most frustrating aspects of a city or county public works official's job.

Since there is virtually no material available on political engineering, I have expanded on my original idea by developing a second group of ten commandments. Here they are:

1. Follow up on every problem which is referred to you by a board member. I felt that this was so important that I set up a separate "tickler" file for these referrals. The outstanding and uncompleted ones would be constantly monitored in order to make sure that they were processed in a timely manner.
2. When the ship is sinking, get off. In my original ten commandments, I advised fighting as hard as you can for your recommendation. However, after board discussion you can begin to count votes and predict the direction of your board. If you see you are going to lose, don't continue pushing and end up antagonizing your board.
3. Lobby individual board members before the open board session, as a "warm-up" for persuading the full board on the day of a public hearing or a vote. Sometimes there are board members who tend to lead the pack. If there are such board members, I would concentrate my efforts on them. But make sure that you don't offend some board members by leaving them out of your lobbying because you think you have the votes you need without them.
4. If you have a recommendation or proposal and know you don't have the votes, delay bringing it to the board if you possibly can. Do more ground work before you put it on the agenda.
5. Arrange field trips for individual board members. When they express an interest in a project or problem area, take them out and show it to them. While you are on the field trip, show them deficiencies that you may be bringing to the board for future funding. While you're with them, you have an excellent chance to discuss other important matters. This is a much better environment for carrying out discussions with them than in the office, where they are constantly interrupted.
6. Use a program budget. Structure the budget so that, in order to add a program outside the normal budget cycle, the full board must vote to take funding away from another project. This approach will discourage individual board members from trying to insert a pet project in the middle of a budget year.
7. Encourage individual board members to work through you on matters of special interest to them, rather than going straight to your staff. This is difficult with some board members, who prefer to go straight to the staff member most likely to have an immediate answer. When I knew I couldn't discourage this action, I wouldn't fight it. However, I made sure staff only gave information and never took direction from them. If a board member attempted to give direction, the staff member would refer the board member to me. I also made sure that staff would confer with me and update me on what had transpired after a board member's visit.
8. Stay out of political campaigns, especially elections for places on your own board. The incumbent that you may be assisting could lose the election, and you could end up with the opposition as one of your new bosses.
9. Make a point of "fraternizing" with your board members when you are attending the same conference. As board members get to know you better, you will have the opportunity to go beyond the stereotyped image of engineers which elected officials sometimes have. Make sure you do not favor one board member over others.
10. Never show open animosity toward the board or any of its members. Sometimes board members will do or say something to make you look bad, either at a board meeting or in front of one of their constituents. Always maintain your "cool" and act professionally.

I hope you find these "political engineering" principles useful for reducing stress in your political environment. And good luck to you on your way up the career ladder!

(Source: TECH TRANSFER, October 1993 Technology Transfer Center Program, University of California.)

One-Minute Stress Beaters

If you're like most people, stress is an unavoidable part of your life and work. Most psychologists agree that stress is good for you if you don't get more than you can handle, and if you learn how to respond to it. Here are some techniques for handling stress when it seems to be getting the better of you.

Mental Exercises

While stress is certainly not "all in your head," you can reduce mental stress by practicing these responses:

- ✓ **Try Deep Breathing:** Inhale deeply, feeling your stomach expand. Hold your breath for a few seconds, then slowly exhale. Picture the tension leaving your body as you let all the air out.
- ✓ **Try Meditation:** Close your eyes and mentally follow your breath as it goes in and out. As you exhale, mentally repeat a simple or soothing word with each breath. Or visualize a scene that is peaceful and meaningful to you, as you breathe. This exercise is most effective if done for 10 to 20 minutes, but once you learn to use it, it can trigger relaxation in a minute or two.
- ✓ **Do Self-Talk:** Most of us are involved in a mental dialogue that may be self-defeating. Make a list of the things causing stress in your life, and your mental response to them. If you find yourself frequently writing "I can't," rewrite your response in a positive way, such as, "I know I can do it," "Everything is going to work out" or "I'm the best person for this job."
- ✓ **Get Organized:** Sometimes having too many things to do and remember causes stress. Simply making a list of them and setting priorities can help you accomplish them one at a time.
- ✓ **Laugh More:** Don't forget to exercise your humor muscle. Sometimes humor helps you step back and see things from a different perspective.

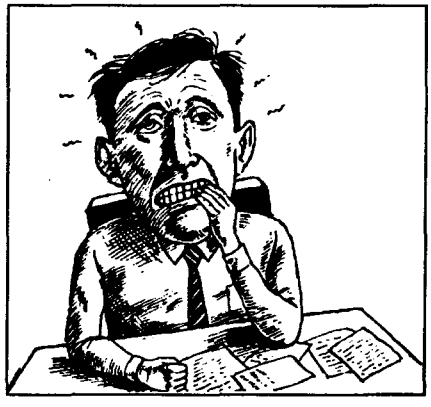
The Physical Response

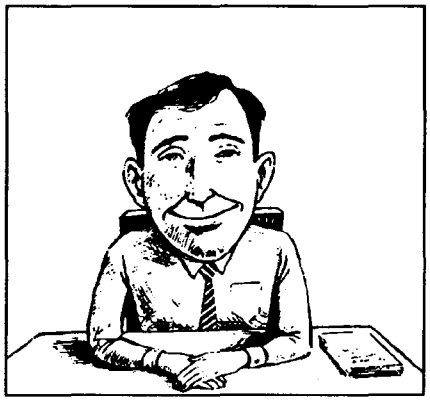
You know how stress affects your body: headaches, tense muscles, digestive upsets. Use these exercises to reduce physical tension:

- ✓ **Relax Your Muscles:** While sitting or lying in a relaxed position, tense the muscles of your feet as much as you can; then relax them, and notice the difference in feeling. Tense and relax the muscles in your legs, arms, stomach, back, neck and head, one region at a time. Finish with your whole body in a state of complete physical relaxation.
- ✓ **Stretch:** This is especially good for muscles in your neck and back. Sit in a chair with your upper body resting forward on your lap. Slowly roll up, starting at the base of your spine, until your back is straight. To stretch neck muscles tilt your head to the right and slowly roll your head in an arc down and to the left. Repeat a few times. Shrug your shoulders and roll them in circles. Get up and walk around to stretch your legs.
- ✓ **Massage:** With your right hand, reach around to your left shoulder and neck from in front. Massage the shoulder muscles, working your way up along the neck to the scalp. Repeat on the other side.
- ✓ **Watch Your Posture:** Slumping, a natural response to sitting at a desk all day, causes tension in your neck and back muscles, and sends your mind a message of discouragement. When you notice yourself slumping, correct your posture and notice how relieved those muscles feel, how much better your outlook suddenly is.

Stress Reduction is a Learned Response

Practice one or more of these exercises several times a day and you will notice that your body and mind soon learn to respond by relaxing. In fact, the more you do these exercises, the better they work.





Common Symptoms of Stress

1. *Fatigue, irritability, anxiety, or depression.*
2. *Insomnia or too much sleep.*
3. *Appetite changes.*
4. *Unexplained crying, nervousness, or trembling.*
5. *Headache, back, neck, or chest pain.*
6. *Diarrhea or constipation.*
7. *Shortness of breath.*

In the News

Nylon Tape Protects Wildlife

By Randy Blacker, Lethbridge District

During a recent visit to British Columbia, I noticed several fences parallel to the highway were marked with a yellow and black woven nylon tape.

This tape was fastened to the top wire of the fence and was continuous for many kilometers with intermittent breaks for gates, entrances, and road allowances.

The intent of this nylon tape is to make wildlife aware of the location of the top of the fence. This enables the wildlife to jump over the fence without damaging the fence or injuring themselves.

A spokesperson for British Columbia Highways informed us that since the inception of this practice, fence maintenance costs have been greatly reduced.

Although the land owner or leasee is responsible for fence maintenance within our Province, it may still be desirable to examine the use of this product in areas that are fenced for grazing purposes and have significant wildlife movements. This work could be included with initial fence construction or land owners could be encouraged to use it where there has been a problem in the past.

Possible benefits are: less fence maintenance, reduced livestock intrusion on roadway, and reduced injuries to wildlife.

(Source: Transearch, August 1994. Alberta Transportation and Utilities, Canada.)

ASCE Supports Continuing Education for Relicensing

ASCE, America's oldest national engineering society, is working to make continuing education a condition for the relicensing of civil engineers nationwide and to make continuing education requirements uniform in states that already mandate continuing education as a prerequisite to relicensing. ASCE's position reflects a trend in many professions toward stronger educational requirements for association membership, licensing, and relicensing. "The volume of even basic knowledge for civil engineers to stay current is growing at an unparalleled rate," said James W. Poirot, ASCE president. "Civil engineers hold a sacred public trust. Public opinion polls reveal that consumers rank engineers among America's most respected groups. But to maintain that trust, like all professions, civil engineering faces a dramatic and prolonged period of transition. The world is turning faster, and civil engineering must move with it."

—American Society of Civil Engineers

FHWA Seeks Intergovernmental Personnel

The Federal Highway Administration (FHWA) is seeking applicants from state and local governments interested in participating in temporary assignments within the agency.

A variety of assignment opportunities are available for three to 12 months, extending in rare circumstances to as long as two years. The program is intended to allow the movement of highly skilled and talented individuals between the FHWA and other institutions to perform work of mutual concern and benefit.

Assignments can include specific transportation research projects; independent evaluations of major governmental programs and/or initiatives; development of innovative solutions to federal, state or local partnership issues; development of transportation/planning models; development of public policy initiatives; or design of experimental programs in systems management, organizational development or resource utilization.

Technical program areas include structures, hydraulics, geotechnical engineering, pavements, materials, environment, urban planning, air quality, traffic management, safety, and hazardous materials. Business areas include regulation, finance, and enforcement.

For more information, contact the FHWA Office of Personnel and Training, Personnel Operations Division, HPT-23, 400 Seventh Street SW, Washington, D.C. 20590, telephone (202) 366-0485.

(Source: AASHTO Journal, September 9, 1994.)

In the News (Continued)

NCHRP Projects Selected for 1995

The following are new projects for the National Cooperative Highway Research Program (NCHRP) in fiscal year 1995.

Project statements inviting proposals for research on most of these projects are scheduled to be issued during the second half of 1994, and research is expected to begin early in 1995. Prospective proposers may be added to the mailing list by writing to Program Officer, Cooperative Research Programs, Transportation Research Board, National Research Council, 2101 Constitution Avenue NW, Washington, DC 20418.

Project No. and Title

1-33	Comprehensive Framework for Pavement Investment Strategies
1-34	Cost-Effectiveness of Subsurface Pavement Drainage
2-19	Transportation Investment and Economic Productivity Research
2-20	Economic Trends and Transportation Requirements
3-52	Implementing Access Management Strategies
3-53	Development of HOV Systems Manual
3-54	Modified MUTCD Signal Operation for Permitted/ Protected, Lead/Lag Left Turns
3-55	Development and Delivery of the Year 2000 Highway Capacity Manual (HCM)
4-20	Aggregate Tests Related to Performance of Portland Cement Concrete
4-21	Appropriate Use of Waste and Recycled Materials in Highway Construction
4-22	Best Traffic Line Striping Material
8-32(3)	Integration of Land Use Planning with Multimodal Transportation Planning
8-32(4)	Develop and Maintain Partnerships for Multimodal Planning
8-32(5)	Develop Improved Data and Data-Collection Efforts
8-33	Quantification of Air Quality Benefits and Costs Resulting from Measures to Reduce Automobile Travel
10-44	Characterization of In Situ Materials Properties of Pavement Structures
10-45	Procedures for Evaluating the Performance of Admixtures as Corrosion Inhibitors
10-46	Corrosion of Steel Piling
12-42	Ongoing LRFD Bridge Design Specification Support
14-12	Maintenance Quality Assurance
17-12	Identification of Vehicular Accident Characteristics and Reporting Systems With Respect to Design Criteria Selection
18-3	Silica Fume Concrete for Bridge Decks
20-39	Identification of User Needs for On-Line Access to TRIS Through the AASHTO VAN
20-40	Conversion of AASHTO Publications and Software to Metric Units
22-12	Guidelines for the Selection, Installation and Maintenance of Highway Safety Features
24-7	Alternate Countermeasures to Protect Bridge Piers From Scour
24-8	Research Needs: Scour at Bridge Foundations
25-11	Modal Emission Factor Development

(Source: Public Roads, Autumn 1994.)

FHWA Establishes SHRP Clearinghouse

FHWA has developed the FHWA Strategic Highway Research Program (SHRP) Information Clearinghouse. The clearinghouse is a computer-based collection of up-to-date information on the status of SHRP's products and FHWA's implementation activities. Users can access the clearinghouse through FHWA's local and wide area networks, or a user can dial the system directly using a modem. For more information, contact Margie Sheriff in FHWA's Office of Technology Applications (telephone (202) 366-1747, fax (202) 366-7909).

Quote by Henry Austin

"Genius, that power that dazzles mortal eyes, is often perseverance in disguise."

Skills Enhancement Opportunities

The purpose of this column is to inform you of the numerous educational opportunities that exist for Washington State and adjacent states' transportation people.

Northwest Technology Transfer Center
(206) 705-7386

- ❒ Contract Special Provision Writing (one-day class) and Contract Plans, Specifications, and Estimate Preparation, Transmittal, and Review (two-day class). Classes will be held in Seattle, Wenatchee, Yakima, Vancouver, Spokane, and Olympia beginning mid-October and running through early spring. Classes may be scheduled in other locations if enough interest is shown. Call Laurel Gray in the T^2 Center to register or for further information.

American Public Works Association
(206) 543-5539, Fax (206) 543-2352

- ❒ International Symposium: Public Works and the Human Environment. April 19-21, 1995, in Seattle.

Keye Productivity Center
1-800-821-3919 or (913) 345-2140

- ❒ How to Build, Manage, and "Grow" Self-Directed Work Teams. Seattle, December 12-13. $295.

Seminars International
1-800-843-8084, (913) 681-6660, or Fax (913) 681-3258

- ❒ Keeping Your Emotions Under Control: How to Deal with Confrontations, Clashes, and Angry People. November 15, Seattle; November 16, Olympia; November 17, Tacoma; November 18, Portland, OR. $99/$89 for four or more.

Washington State University Conferences and Institutes
1-800-942-4978 or (509) 335-3530, Fax (509) 335-0945

- ❒ Empowering Teams, People, and the Organization Through Horizontal Management. Sea-Tac, December 5-6. $795.

Professional Engineering Practice Liaison Program (PEPL) University of Washington, College of Engineering
(206) 543-5539

- ❒ Seismic Design of Structures I: Dynamic Analysis and Lateral Load Determination. November 1, 3, 8, 15, 17, and 22.
- ❒ Health and Safety Eight-Hour Refresher Course for Underground Storage Tank Workers. November 9.
- ❒ Biofiltration for Stormwater Quality Enhancement. November 16.
- ❒ Avoidance and Resolution of Construction Delay Claims in Public Works Project. November 17.
- ❒ The Land Development Permit Process: How to Avoid Napoleon's March to Moscow! December 1. Third in a trilogy of seminars on land usability.
- ❒ Applications of Erosion and Sedimentation Control Practices. December 14.

TRANSPEED (Transportation Partnership in Engineering Education Development)
(206) 543-5539

Prices: One-day course: $80 All Public Agency Staff/$150 Others, Two-day course: $120/$300, Three-day course: $160/350.

- ❒ Stormwater Engineering for Transportation Engineers. November 8-10, Lacey.
- ❒ Construction Inspection of Public Works Projects. December 1-2, Seattle.
- ❒ Public Works Construction Project Management. December 5-6, Seattle.

Measurement Research Corporation (MRC)
(206) 851-3200, Fax (206) 851-4334

- ❒ NDT and Pavement Design. November 15-16. $125.

Center for Continuing Education
(206) 462-6261, Fax (206) 462-6316

- ❒ Recent Advances in Pipeline Design and Construction. November 10-11, Seattle. $595.

Department of Labor and Industries Consultation and Education Program
(206) 956-5451

The following is a listing of free L&I classes scheduled through December 1994, contact L&I for details. Class dates are too numerous to list here. Call L&I for a complete list. Many classes may be scheduled in each city listed.

- ❒ Accident Investigation. Bellingham, Everett, Kennewick, Moses Lake, Mount Vernon, Spokane, Tacoma, Tukwila, Wenatchee, Yakima. A workshop can be conducted at your place of business. 3 hours.
- ❒ Accident Prevention Programs. Bremerton, Clarkston, Colville, Ephrata, Everett, Mount Vernon, Okanogan, Pasco, Port Angeles, Spokane, Tacoma, Tukwila, Tumwater, Vancouver, Walla Walla, Yakima. 8 hours.

- ❒ **Bloodborne Pathogens.** Colville, Everett, Kennewick, Mount Vernon, Spokane, Tacoma, Tukwila, Tumwater, Vancouver. 3 hours.
- ❒ **Controlling Your Claims Costs.** Aberdeen, Bellingham, Everett, Kennewick, Longview, Moses Lake, Mount Vernon, Spokane, Tacoma, Tukwila, Tumwater, Vancouver, Wenatchee, Yakima. 4 hours.
- ❒ **Excavation and Trenching (standards and codes).** Ephrata, Everett, Moses Lake, Mount Vernon, Okanogan, Pasco, Spokane, Tacoma, Tukwila, Wenatchee, Yakima. 4 hours.
- ❒ **Fall Protection.** Ephrata, Everett, Moses Lake, Mount Vernon, Okanogan, Pasco, Spokane, Tacoma, Tukwila, Wenatchee, Yakima. 4 hours.
- ❒ **Hazard Communication.** Everett, Mount Vernon, Pasco, Spokane, Tacoma, Tukwila, Tumwater, Vancouver. 3 hours.
- ❒ **Hazardous Waste Operations and Emergency Response.** Tumwater, Vancouver. 3 hours.
- ❒ **Lockout/Tagout.** Everett, Mount Vernon, Tacoma. 2-3 hours.
- ❒ **RETRO — Optional Financial Incentives.** Retrospective rating is an optional financial incentive program designed to reward accident prevention and claims management. Bremerton, Kennewick, Mount Vernon, Spokane, Tukwila, Tumwater, Vancouver, Yakima. 3 hours.
- ❒ **Return-to-Work Programs Make Sense.** Aberdeen, Bellingham, Bremerton, Everett, Kennewick, Longview, Moses Lake, Mount Vernon, Port Angeles, Spokane, Tacoma, Tukwila, Tumwater, Vancouver, Wenatchee, Yakima. 3 hours.
- ❒ **Supervisor's Guide to Loss Control.** This session can be presented at your place of business. Bellingham, Everett, Kennewick, Longview, Moses Lake, Mount Vernon, Spokane, Tacoma, Vancouver, Wenatchee. 3½ hours.
- ❒ **Take Control of Workers' Compensation.** Spokane, Tacoma, Tumwater. 3 hours.
- ❒ **Workers' Comp: Who and How to Report.** This workshop does not address the claims process or completion of the OSHA 200 form. Bellevue, Bellingham, Ellensburg, Everett, Kennewick, Moses Lake, Mount Vernon, Okanogan, Seattle, Spokane, Tacoma, Tukwila, Wenatchee, Yakima. 3 hours.

Phone-in registration for the following L&I classes. Call the phone number listed for each city.

- ❒ **Office Ergonomics.** Recent dramatic increases in cumulative trauma claims such as tendinitis, carpal tunnel syndrome, and back disorders cause us to look closely at these injuries. Aberdeen, Longview, Tumwater, Vancouver: (206) 956-6768. Bellingham, Everett, Mount Vernon: (206) 290-1382. Kennewick, Wenatchee, Yakima: (509) 454-3784. Spokane: (509) 324-2624. Tukwila: (206) 248-8242. 2 hours.
- ❒ **Ergonomics for Employers.** Everett, Mount Vernon: (206) 290-1382. Kennewick, Wenatchee, Yakima: (509) 228-3784. Spokane: (509) 324-2624. Tukwila: (206) 248-8242. Tumwater: (206) 956-6768. 3½ hours.
- ❒ **Job Analysis.** Hands-on workshop will teach employers to prepare job analyses and to identify transitional work for injured workers. Bellingham, Everett, Mount Vernon: (206) 676-2210. Bremerton, Port Angeles, Tacoma: (206) 596-3884. Kennewick, Wenatchee, Yakima: (509) 454-3776. Spokane: (509) 324-2623. Tukwila: (206) 248-8251. Tumwater, Vancouver: (206) 956-6830. Hours vary.

Washington Environmental Training Center (WETRC)
1-800-562-0858

- ❒ **Basic Water Works.** November 15-17, Lynnwood; December 6-8, Tacoma; February 28-March 2, Lynnwood. $225.
- ❒ **Approved Training for Asbestos-Cement Pipe Work Practices Procedures.** December 2, Renton; February 3, April 7 and June 2 in Renton. $135.
- ❒ **How to Comply with the New Confined Space Entry Standard.** February 14, Lynnwood; March 7, Tacoma. $135.
- ❒ **Water Certification Examination Review.** January 17-19, Yakima; January 24-26, Lynnwood; May 9-11, Yakima; May 16-18, Renton; May 23-25, Tacoma. $225.
- ❒ **Basic Hydraulic Workshop.** February 15-16, Lynnwood; April 20-21, Ellensburg; June 7-8, Renton. $195.

Conferences and Meetings

- ❒ **ASCE November Conference.** November 14-16, San Diego, CA. To register or for more information, call Catherine Tehan at (212) 705-7268.
- ❒ **American Concrete Pavement Association (ACPA) Annual Meeting: "Building a Bright Future."** November 29-December 3. Contact Sara Stephens at (708) 966-2272 or Fax (708) 394-5610. Carlsbad, CA.

Continued on page 12

Selected References

All of the following can be obtained directly from the source given.

Highway Drainage Guidelines — Vol. XI, AASHTO Guidelines for Highways Along Coastal Zones and Lakeshores

AASHTO has announced the availability of this new publication concerning highway construction along shorelines.

The guide provides information on shoreline typography, wave and current characteristics, highway design considerations, shore protection devices, planning for shoreline changes, and hydraulic-related construction and maintenance considerations.

Copies of the 52-page book are available from AASHTO at a cost of $16 for members and $19 for nonmembers, which includes postage and handling. Please specify code HDG-2(V)11.

Logistics for Hazardous Materials Transportation: Scheduling, Routing, and Siting-1990

This 182-page report describes the development of decision support systems to help public and private sector decision makers improve the management of hazardous materials logistics. The areas of principal concern are the routing of hazardous material and waste shipments, the scheduling of these shipments, and the siting of the facilities that process or treat the wastes.

Single copies of this report are available to support state and local officials at no charge. To receive a copy, send a self-addressed mailing label with your request to the Technology Sharing Program; U.S. Department of Transportation; 400 Seventh Street S.W. (M-443.2); Washington, D.C. 20590. Please note the report's title and document number, DOT-T-92-09, in your request.

Human Factors Design Handbook

Wesley E. Woodson, Barry Tillman, and Peggy Tillman; 846 pages; $96.50; McGraw-Hill Book Company, 11 West 19th Street, New York, NY 10011, 1-800-2-MCGRAW.

Every time somebody bangs a knee, bumps a head, or cannot reach something easily, "human factors" were probably not considered in the design. Subtitled, *Information and Guidelines for the Design of Systems, Facilities, Equipment, and Products for Human Use*, this volume presents a tremendous amount of data and practical guidance. The goal is to help design "for the user" rather than making the user adapt to the design.

Civil Engineering for the Community

Dennis Randolph; 86 pages; $20 nonmembers, $15 members, book code 845; American Society of Civil Engineers, Book Orders, P.O. Box 831, Somerset, NJ 08875; 1-800-548-ASCE.

This practical guide presents information on the "other side of engineering," the interpersonal and communications skills required of engineers working in the public arena. It is a nontechnical look at public administration, management, working with citizens and elected officials.

Community Recycling: System Design to Management

Nyles V. Reinfeld et al.; 225 pages; $50; Prentice Hall, Englewood Cliffs, NJ 07632; telephone 1-800-223-1360. A practical guide with do's and don'ts, myths, and reality, different systems, economics, management, and other useful information on recycling.

Free Publications

For Washington recipients only: Contact Laurel Gray at (206) 705-7386 if you want publications.

Rating Unsurfaced Roads — A Field Manual for Measuring Maintenance Problems, CRREL

(Special Report 87-15) This brief report provides the tools necessary to rate and evaluate the unpaved roads of an agency. Prepared by the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL). September 1988.

Unsurfaced Road Maintenance Management, CRREL

(Special Report 92-26) After ratings are made of unsurfaced roads, the next steps are covered in this special report by CRREL. A systematic and organized process is presented on managing the maintenance of these unsurfaced roads. December 1992.

Highway Utility Guide (FHWA-SA-93-049)

The guide "provides the state-of-the-knowledge on the better practices being employed. It addresses the full array of issues which can arise from highway and utility facilities sharing a common right of way." June 1993.

Operating Tips — Flagging

This poster style paper provides a "quick how-to" for flagging. A handy reference and reminder for your flaggers. Prepared by the NWT^2 Center.

Geotextile Selection and Installation Manual for Rural Unpaved Roads (FHWA-RT-89-050)

This report serves as a guide for local officials in selecting and installing geotextiles and presents various techniques to address conditions and situations on rural unpaved roads.

Moving With Metric — Metricube (FHWA-SA-94-018)

This foldable cube shows volume, temperature, mass weight, length, and other interesting facts on metric conversion.

Chevron's Surface Treatment Manual

This oldie but goodie 1985 publication gives in 54 pages practically everything one needs to know on the subject.

Human Factors — The Role of Expectancy and Behavior in Highway Design and Traffic Control

This student workbook was used at a recent NHI workshop by your T^2 Center. We have a few copies left for those traffic engineering types who need to know more about their clients — the traveling public.

Asphalt Pavement Repair Manuals of Practice (SHRP-H-348)

Asphalt Pavement Repair Manuals of Practice contains two pavement maintenance manuals for use by highway maintenance agencies in the field and office. Each is a compendium of good practices for asphalt concrete (AC) crack sealing and filling and pothole repair.

Concrete Pavement Repair Manual of Practice (SHRP-H-349)

Concrete Pavement Repair Manuals of Practice contains two manuals for use of highway maintenance people. Covered in the first manual are the repair of joint seals while the second manual shows the state-of-the-art of rapid repair of partial depth spalls.

Pothole Primer, Special Report No. 81-21, U.S. Army Corps of Engineers

This 28-page guide is for public administrators better understanding and managing of pothole problems. The basics of the causes and solutions to potholes are clearly stated and are valid today as in 1981.

Basic Metric System Participants Workbook, WSDOT

This booklet was used in WSDOT's training course held in 1994. It provides in 51 pages an overview of the metric system. Sample problems with answers are given.

Scrap Tire Utilization Technologies, NAPA

Information series 116 provides a succinct overview of various uses for scrap tires, barriers to implementation, and sample policy statements on solid waste management of waste tires used in Oregon.

State of the Art Survey of Flexible Pavement Crack Sealing Procedures in the United States, CRREL Report 92-18, U.S. Army Corps of Engineers

This brief 20-page guide summarizes current methods and materials used by contractors and state departments of transportation for crack sealing on flexible pavements. Advantages and disadvantages of various repair methods are stated.

Roadside Improvements for Local Roads and Streets, FHWA

This brief, well illustrated, 31-page guide shows low cost methods of improving and enhancing roadside safety. It is not a design manual but provides an overview of improving safety in the road side.

A newsletter of the Local Technical Assistance Program (LTAP)

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Conferences and Meetings continued from page 9

- **Technology Transfer Workshop.** February 2-3, 1995. Alberta Transportation and Utilities. Call (403) 422-2750.
- **40th Annual Convention of the National Asphalt Pavement Association (NAPA).** February 18-23, 1995. Contact LaDonna Burton, Meetings Registrar, (301) 731-4748, Fax (301) 731-4621. Hilton Waikoloa, HA.
- **5th Conference on the Application of Transportation Planning Methods.** April 17-21, 1995, Seattle.
- **APWA: Public Works and the Human Environment.** April 19-21, 1995, Seattle. Contact Engineering Professional Programs at the University of Washington. (206) 543-5539, Fax (206) 543-2352.
- **6th International Conference on Low-Volume Roads.** June 25-29, 1995, Minneapolis, MN.
- **International Symposium on Highway Geometric Design Practices.** August 30-September 1, 1995, Boston, MA.

Bulletin

The Technology Transfer Center (T^2) Program is a nationwide effort financed jointly by the Federal Highway Administration (FHWA) and individual state departments of transportation. Its purpose is to translate into understandable terms the latest state-of-the-art technologies in the areas of roads, bridges, and public transportation to local highway and transportation personnel.

Any opinions, findings, conclusions, or recommendations presented in this newsletter are those of the authors and do not necessarily reflect the views of WSDOT or FHWA. All references to proprietary items in this publication are not endorsements of any company or product.

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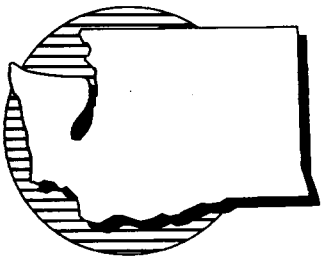

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